INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 2002	**Park:** Shenandoah NP
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Permit#:
SHEN-2002-SCI-0001

Park-assigned Study Id. #:
SHEN-00271

Project Title:
Field Measurements of Metabolic Indices During Hiking

Permit Start Date: Mar 15, 2002	**Permit Expiration Date** Dec 31, 2002
Study Start Date: Mar 15, 2002	**Study End Date** Dec 31, 2006

Study Status:
Continuing

Activity Type:
Research

Subject/Discipline:
Other

Objectives:

This proposal calls for hiking the SNP section of the Appalachian Trail twice in order to compare metabolic differences when hiking with and without trekking poles. Breath-by-breath measurements of sixty physiological variables will be collected via a portable metabolic unit. Several outcomes will result from this project. First, it provides a way to map the AT portion within the Shenandoah Park in terms of energy expended and thus lends additional information for planning in terms of food (calories necessary) and overall effort. Second, it provides an extended analysis of the overall effect trekking poles have in terms of energy expenditure during backpacking. Third, it will provide an extensive field data currently not available which can be filtered and analyzed to create energy expenditure prediction equations sections of the trail that have comparable distances and altitude relief characteristics. A unique feature of the portable metabolic unit (Cosmed K4b2) is the inclusion of a 12 channel GPS unit that integrates speed, distance, and altitude with the metabolic data. The results of this study will be disseminated through subsequent publications and presentations.

Findings and Status:

To date, the Appalachian Trial in southern and central districts has been hiked twice. Analysis of two hundred megabytes of physiological data has been ongoing since June 2002. The Appalachian Trail in the North district remains to be hiked. It is forecasted that this section will be completed in April of 2003. Technical issues related to physiological and GPS data collection presented unique methodological issues that ultimately will contribute to expand the reliability of extended field studies. As data filtering has preceded it is apparent that the use of trekking poles positively affects energy during uphill sections. Further, analysis will reveal whether significant energy conservation occurs during downhill and flat sections of the AT. Elevation profile data measured with a hand held altimeter will be compared with the Cosmed GPS unit and the geological survey maps published by the Potomac Appalachian Trail Club. The data collection period during the spring of 2002 lasted six weeks

For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?
No

Funding provided this reporting year by NPS: 0	**Funding provided this reporting year by other sources:** 0

Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college	
Full name of college or university:	**Annual funding provided by NPS to university or college this reporting year:**
n/a	0